

# INFECTIOUS DISEASES IN SOUTH DAKOTA 2006

The South Dakota Department of Health (DOH) is authorized by South Dakota Codified Law 34-22-12 and Administrative Rules Article 44:20 to receive and process mandatory reports of communicable diseases by physicians, hospitals, laboratories, and institutions.

Category I: Report immediately on suspicion of disease	Category II: Report within 3 days
<p>Anthrax (<i>Bacillus anthracis</i>)  Botulism (<i>Clostridium botulinum</i>)  Cholera (<i>Vibrio cholerae</i>)  Diphtheria (<i>Corynebacterium diphtheriae</i>)  Enterohemorrhagic <i>E. coli</i> (EHEC) shiga-toxin producing (<i>Escherichia coli</i>), includes <i>E. coli</i> O157:H7  Measles (<i>paramyxovirus</i>)  Meningococcal disease, invasive (<i>Neisseria meningitidis</i>)  Pertussis (<i>Bordetella pertussis</i>)  Plague (<i>Yersinia pestis</i>)  Poliomyelitis (<i>picornavirus</i>)  Rabies, human and animal (<i>rhabdovirus</i>)  Ricin toxin  Rubella and congenital rubella syndrome (<i>togavirus</i>)  SARS (Severe Acute Respiratory Syndrome, <i>coronavirus</i>)  Smallpox (<i>Variola</i>)  Tularemia (<i>Francisella tularensis</i>)  Typhoid (<i>Salmonella typhi</i>)  Viral Hemorrhagic Fevers (filoviruses, arenaviruses)</p> <p>Outbreaks: - Acute upper respiratory illness  - Diarrheal disease  - Foodborne  - Illnesses in child care settings  - Nosocomial  - Rash illness  - Waterborne</p> <p>Syndromes suggestive of bioterrorism and other public health threats  Unexplained illnesses or deaths in humans or animals</p>	<p>Acquired immunodeficiency syndrome (AIDS)  Arboviral encephalitis, meningitis and infection (<i>West Nile, St. Louis, Eastern and Western equine, California serotype, Japanese, Powassan</i>)  Brucellosis (<i>Brucella spp.</i>)  Campylobacteriosis (<i>Campylobacter spp.</i>)  Chancroid (<i>Haemophilus ducreyi</i>)  Chicken pox/Varicella (<i>herpesvirus</i>)  Chlamydia infections (<i>Chlamydia trachomatis</i>)  Cryptosporidiosis (<i>Cryptosporidium parvum</i>)  Cyclosporiasis (<i>Cyclospora cayetanensis</i>)  Dengue fever (<i>flavivirus</i>)  Drug resistant organisms:  • Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA), invasive  • Vancomycin-resistant and -intermediate <i>Staphylococcus aureus</i> (VRSA and VISA)  • Drug resistant <i>Streptococcus pneumoniae</i> (DRSP), invasive  Ehrlichiosis (<i>Ehrlichia spp.</i>)  Epsilon toxin of <i>Clostridium perfringens</i>  Giardiasis (<i>Giardia lamblia / intestinalis</i>)  Glanders (<i>Burkholderia mallei</i>)  Gonorrhea (<i>Neisseria gonorrhoeae</i>)  <i>Haemophilus influenzae</i> type b disease, invasive  Hantavirus pulmonary syndrome (<i>hantavirus</i>)  Hemolytic uremic syndrome  Hepatitis, acute viral A, B, C, D, and E  Hepatitis, chronic viral B and C  Hepatitis B infection, perinatal  <i>Herpes simplex</i> virus infection, neonatal or genital  Human immunodeficiency virus infection (HIV)</p> <p>Influenza: all lab confirmed cases, pediatric deaths and - weekly reports of number of rapid antigen influenza positive tests and total number tested  Legionellosis (<i>Legionella spp.</i>)  Leprosy/Hansen's disease (<i>Mycobacterium leprae</i>)  Listeriosis (<i>Listeria monocytogenes</i>)  Lyme disease (<i>Borrelia burgdorferi</i>)  Malaria (<i>Plasmodium spp.</i>)  Meliodosis (<i>Burkholderia pseudomallei</i>)  Mumps (<i>paramyxovirus</i>)  Nipah virus (<i>paramyxovirus</i>)  Psittacosis (<i>Chlamydophila psittaci</i>)  Q fever (<i>Coxiella burnetii</i>)  Rocky Mountain spotted fever (<i>Rickettsia rickettsii</i>)  Salmonellosis (<i>Salmonella spp.</i>)  Shigellosis (<i>Shigella spp.</i>)  Staphylococcus enterotoxin B  Streptococcal disease, Group A, invasive  Streptococcal disease, Group B, invasive  <i>Streptococcus pneumoniae</i>, invasive, in a child less than 5-years of age  Syphilis (<i>Treponema pallidum</i>)  Tetanus (<i>Clostridium tetani</i>)  Toxic shock syndrome  Transmissible spongiform encephalopathies  Trichinosis (<i>Trichinella spiralis</i>)  Tuberculosis (<i>Mycobacterium tuberculosis</i> and <i>Mycobacterium bovis</i>) active disease and latent infection (positive skin test)  Typhus fever (<i>Rickettsia prowazekii</i>)  Vaccine Adverse Events  Yellow fever (<i>flavivirus</i>)</p>

## WHEN TO REPORT

**Category I diseases** are reportable immediately by telephone on recognition or strong suspicion of disease.


**Category II diseases** are reportable by telephone, mail, or fax within 3 days of recognition or strong suspicion of disease.

**WHAT TO REPORT:** Disease reports must include as much of the following as is known:

- Disease or condition diagnosed or suspected
- Case's name, age, date of birth, sex, race, address, and occupation
- Date of disease onset
- Pertinent laboratory results and date of specimen collection
- Attending physician's name, address and phone number
- Name and phone number of the person making the report.

## HOW TO REPORT

 **Secure website:** [www.state.sd.us/doh/diseasereport](http://www.state.sd.us/doh/diseasereport)

 **Telephone:** **1-800-592-1804** confidential answering-recording device, or **1-800-592-1861** or **605-773-3737** for a disease surveillance person during normal business hours; after hours to report Category I diseases or other emergencies, call **605-280-4810**.

 **Fax:** **605-773-5509**

 **Mail or courier,** address to: Infectious Disease Surveillance, Office of Disease Prevention, Department of Health, 615 East 4th Street, Pierre, SD 57501; marked "*Confidential Disease Report*"

## COMMUNICABLE DISEASE SURVEILLANCE

The Department of Health (DOH) has adopted administrative rules, ARSD 44:20, authorizing a statewide surveillance system for communicable diseases. The rules also establish public health measures that control and prevent disease transmission.

Infectious disease surveillance is the ongoing collection, analysis, interpretation, and dissemination of health data. This type of assessment is a core public health function. Communicable disease surveillance monitors patterns of disease occurrence, which contribute to the health status of South Dakota's population. Surveillance can detect sudden changes in disease occurrence, such as outbreaks, or identify long-term disease trends, or monitor new and emerging diseases. Surveillance activities are linked to public health actions, such as investigation, control and prevention, evaluation, planning, and allocating resources to address the diseases affecting the population.

An important surveillance component is sharing infectious disease data with health care providers, public health agencies, the general population, academia, and public health and medical policy makers at local, state, tribal and national levels. Surveillance assessment reports should serve to inform and motivate.

Table 75 catalogs the infectious disease reports from 1996 to 2006. Table 76 reports the 2006 disease numbers by county of residency, statewide total, and shows the statewide incidence rate (cases per 100,000 population). Each disease is compared to the median case count of the previous five years (2001-2005), and the percentage increase or decrease is shown. Table 77 presents selected diseases stratified by gender, race, and age group.

In 2006 the following diseases (cases) were reported and found to meet the case definition:

- Anthrax (0)
- Botulism (0)
- Brucellosis (0)
- Campylobacteriosis (219)
- Chancroid (0)
- Chlamydia trachomatis infections (2,633)
- Cholera (0)
- Cryptosporidiosis (86)
- Dengue fever (0)
- Diphtheria (0)
- Giardiasis (97)
- Gonorrhea (367)
- Haemophilus influenzae type B (0)
- Hantavirus pulmonary syndrome (2)
- Hemolytic uremic syndrome (8)
- Hepatitis A (9)
- Hepatitis B, acute (5)
- Hepatitis B, chronic (16)
- Hepatitis C, chronic (355)
- Herpes simplex, genital and neonatal (371)
- HIV and AIDS (34)
- Legionellosis (5)
- Leprosy (0)
- Listeriosis (2)
- Lyme disease (1)
- Malaria (1)
- Measles (0)
- Meningococcal disease (4)
- Methicillin resistant *Staphylococcus aureus*, invasive (50)
- Mumps (296)
- Pertussis (26)
- Plague (0)
- Polio (0)
- Psittacosis (0)
- Q fever (2)
- Rabies, animal (38)
- Rabies, human (0)
- Rocky Mountain spotted fever (0)
- Rubella and congenital rubella syndrome (0)
- Saint Louis encephalitis (0)
- Salmonellosis (135)
- Shiga-toxin producing *E. coli* (50)
- Shigellosis (389)
- Streptococcal disease, Group A, invasive (10)
- Streptococcal disease, Group B, invasive (13)
- *Streptococcus pneumoniae*, drug resistant (4)
- Syphilis, primary and secondary, early latent (19)
- Tetanus (0)
- Toxic shock syndrome (0)
- Transmissible spongiform encephalopathies (1)
- Trichinosis (0)
- Tuberculosis (14)
- Tularemia (5)
- Varicella (118)
- West Nile neuroinvasive disease (38)
- West Nile fever (74)

**Table 75**  
**Reportable Diseases in South Dakota, 1996-2006**

Reportable Diseases	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Anthrax	0	0	0	0	0	0	1	0	0	0	0
Botulism	0	0	0	1	1	0	0	1	0	1	0
Brucellosis	0	0	0	0	0	0	0	1	0	0	0
Campylobacteriosis	71	108	103	140	141	160	198	188	273	244	219
Chlamydia trachomatis infections	1538	1439	1573	1554	1835	1821	2215	2606	2534	2701	2633
Cholera	0	0	0	0	0	0	1	0	0	0	0
Cryptosporidiosis	0	23	25	7	15	8	42	49	44	31	86
Denque fever	0	0	0	0	0	0	1	0	0	1	0
Diphtheria	0	1	0	0	0	0	0	0	0	0	0
Giardiasis	89	127	181	143	108	106	83	89	87	118	97
Gonorrhea	176	172	221	192	277	289	263	226	304	351	367
Haemophilus influenzae type b	1	3	1	4	1	0	1	1	0	0	0
Hantavirus pulmonary syndrome	0	0	0	0	1	0	0	1	1	2	2
Hemolytic uremic syndrome	0	1	0	4	2	1	0	1	0	3	8
Hepatitis A	43	27	40	10	3	3	3	0	4	1	9
Hepatitis B, acute	5	1	4	1	2	1	3	4	1	8	5
Hepatitis B, chronic	NR	NR	NR	NR	NR	NR	NR	NR	26	33	16
Hepatitis C, chronic	NR	NR	NR	NR	NR	NR	NR	NR	NR	207	355
Herpes simplex, genital and neonatal	102	94	142	275	339	345	310	297	322	342	371
HIV and AIDS	24	25	17	27	22	22	21	25	19	33	34
Legionellosis	3	4	7	6	2	3	4	2	5	21	5
Leprosy	0	0	1	0	0	0	0	0	0	0	0
Listeriosis	1	1	0	1	0	0	1	0	1	0	2
Lyme disease	0	1	0	0	0	0	2	1	1	2	1
Malaria	2	3	1	0	1	0	2	3	1	0	1
Measles	0	8	0	0	0	0	0	0	0	0	0
Meningococcal disease	10	6	9	11	6	5	2	1	4	4	4
Methicillin-resistant <i>Staph aureus</i> , invasive	NR	NR	NR	NR	NR	NR	NR	NR	36	47	50
Mumps	0	0	0	0	0	0	0	0	0	0	296
Pertussis (whooping cough)	4	5	8	8	11	5	8	7	169	183	26
Plague	0	0	0	0	0	0	0	0	0	0	0
Q fever	NR	NR	NR	NR	NR	0	1	0	0	2	2
Rabies, animal	132	94	166	180	96	58	96	132	94	68	38
Rabies, human	0	0	0	0	0	0	0	0	0	0	0
Rocky Mountain Spotted Fever	1	2	0	4	2	2	1	5	4	5	0
Rubella and congenital rubella syndrome	0	0	0	0	0	0	0	0	0	0	0
St. Louis Encephalitis	0	0	0	0	0	0	0	2	0	0	0
Salmonellosis	119	90	132	100	100	151	121	131	156	160	135
Shiga-toxin producing E. coli, including O157:H7	26	29	37	47	69	50	43	33	35	33	50
Shigellosis	94	31	33	18	8	716	157	17	12	131	389
Streptococcal disease, Group A, invasive	NR	15	9	11	16	17	14	25	22	26	10
Streptococcal disease, Group B, invasive	NR	NR	NR	NR	NR	NR	20	14	11	26	13
<i>Streptococcus pneumoniae</i> , drug resistant	NR	0	0	3	8	6	1	1	5	3	4
Syphilis, Primary and Secondary, Early Latent	0	3	1	1	0	1	0	5	0	2	19
Tetanus	0	0	1	0	0	0	0	0	0	0	0
Toxic shock syndrome	0	1	2	0	2	0	1	1	1	2	0
Transmissible spongiform encephalopathies	--	--	--	1	0	1	0	2	2	0	1
Tuberculosis	19	19	23	21	16	13	13	20	11	16	14
Tularemia	11	4	3	7	13	7	3	5	4	8	5
Varicella (chicken pox)	NR	NR	NR	NR	NR	NR	NR	NR	99	136	118
West Nile neuroinvasive disease	0	0	0	0	0	0	14	170	6	35	38
West Nile fever	0	0	0	0	0	0	23	869	45	194	74

\*NR= not reportable

Source: South Dakota Department of Health, Office of Disease Prevention

**Table 76a**  
**South Dakota Selected Notifiable Diseases by County, 2006 (continued)**

County	Campylobacteriosis	Chlamydia	Cryptosporidiosis	<i>Shiga-toxin producing E. coli</i>	Giardiasis	Gonorrhea	Hepatitis C, Chronic	Methicillin-resistant <i>Staphylococcus aureus</i> , invasive	Mumps	Pertussis	Salmonellosis	Shigellosis	Tuberculosis	Varicella	West Nile Disease
Aurora	4	≤ 3	0	0	0	0	≤ 3	≤ 3	≤ 3	0	0	0	0	≤ 3	0
Beadle	10	29	4	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	0	≤ 3	5	0	0	0	≤ 3
Bennett	0	16	0	0	≤ 3	4	≤ 3	≤ 3	0	0	≤ 3	≤ 3	0	≤ 3	0
Bon Homme	≤ 3	4	≤ 3	0	≤ 3	0	24	0	4	0	≤ 3	0	0	≤ 3	≤ 3
Brookings	4	76	≤ 3	4	5	7	5	≤ 3	10	7	7	0	0	0	6
Brown	14	122	11	≤ 3	≤ 3	7	19	≤ 3	42	0	7	≤ 3	0	0	17
Brule	5	4	≤ 3	4	≤ 3	0	≤ 3	≤ 3	≤ 3	0	0	≤ 3	0	0	≤ 3
Buffalo	0	15	0	0	0	≤ 3	0	≤ 3	0	0	≤ 3	17	0	4	≤ 3
Butte	≤ 3	4	0	≤ 3	5	0	≤ 3	0	8	0	≤ 3	0	0	0	≤ 3
Campbell	≤ 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Charles Mix	4	65	≤ 3	≤ 3	≤ 3	18	4	≤ 3	20	0	0	7	0	≤ 3	≤ 3
Clark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	≤ 3
Clay	0	29	≤ 3	0	≤ 3	12	0	0	18	5	4	0	0	0	≤ 3
Codington	≤ 3	73	≤ 3	4	≤ 3	≤ 3	4	≤ 3	6	0	≤ 3	0	≤ 3	≤ 3	0
Corson	≤ 3	37	0	0	≤ 3	4	≤ 3	0	≤ 3	0	≤ 3	≤ 3	0	0	0
Custer	0	29	≤ 3	0	0	≤ 3	≤ 3	0	4	0	0	≤ 3	0	≤ 3	0
Davison	10	55	≤ 3	≤ 3	4	4	≤ 3	0	21	0	5	≤ 3	0	≤ 3	≤ 3
Day	≤ 3	7	0	0	≤ 3	0	0	≤ 3	≤ 3	0	≤ 3	0	0	≤ 3	≤ 3
Deuel	0	≤ 3	≤ 3	0	0	0	≤ 3	≤ 3	≤ 3	0	0	0	0	0	0
Dewey	0	135	0	0	0	40	≤ 3	≤ 3	0	0	0	13	≤ 3	0	0
Douglas	10	≤ 3	0	0	0	0	≤ 3	0	4	0	≤ 3	≤ 3	0	0	0
Edmunds	4	≤ 3	≤ 3	≤ 3	≤ 3	0	≤ 3	0	≤ 3	0	≤ 3	0	0	0	0
Fall River	0	9	0	0	0	0	7	0	≤ 3	0	0	0	0	0	≤ 3
Faulk	6	0	≤ 3	0	0	0	0	0	≤ 3	0	≤ 3	0	0	0	≤ 3
Grant	6	≤ 3	0	0	0	≤ 3	≤ 3	≤ 3	0	0	0	0	0	0	≤ 3
Gregory	≤ 3	7	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	0	≤ 3	0	≤ 3	≤ 3	0	0	0
Haakon	≤ 3	0	0	0	0	0	0	0	0	0	≤ 3	0	0	0	0
Hamlin	≤ 3	≤ 3	0	0	0	0	≤ 3	≤ 3	4	0	0	0	0	0	0
Hand	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hanson	≤ 3	0	0	≤ 3	≤ 3	0	≤ 3	0	4	0	0	0	0	0	≤ 3
Harding	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hughes	≤ 3	68	0	0	≤ 3	5	5	≤ 3	≤ 3	0	≤ 3	32	0	4	≤ 3
Hutchinson	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	0	0	≤ 3	0	≤ 3	0	0	0	≤ 3
Hyde	≤ 3	0	0	≤ 3	0	0	≤ 3	0	≤ 3	0	0	0	0	0	0
Jackson	≤ 3	8	0	0	0	≤ 3	≤ 3	0	0	0	≤ 3	0	0	0	0
Jerauld	≤ 3	≤ 3	0	0	0	0	≤ 3	0	0	0	≤ 3	0	0	≤ 3	0

Continued

**Table 76b**  
**South Dakota Selected Notifiable Diseases by County, 2006 (continuing)**

County	Campylobacteriosis	Chlamydia	Cryptosporidiosis	Shiga-toxin producing <i>E. coli</i>	Giardiasis	Gonorrhea	Hepatitis C, Chronic	Methicillin-resistant <i>Staphylococcus aureus</i> , invasive	Mumps	Pertussis	Salmonellosis	Shigellosis	Tuberculosis	Varicella	West Nile Disease
Jones	≤ 3	0	0	0	0	0	0	0	0	0	0	0	0	0	≤ 3
Kingsbury	≤ 3	0	0	0	0	0	0	0	≤ 3	0	≤ 3	≤ 3	0	0	≤ 3
Lake	≤ 3	16	0	0	≤ 3	≤ 3	≤ 3	0	≤ 3	0	0	0	0	0	6
Lawrence	4	69	0	0	5	6	7	0	10	0	≤ 3	≤ 3	0	≤ 3	≤ 3
Lincoln	8	8	≤ 3	0	≤ 3	0	5	≤ 3	≤ 3	0	≤ 3	0	0	≤ 3	≤ 3
Lyman	≤ 3	13	0	0	0	≤ 3	0	0	0	0	≤ 3	44	0	0	≤ 3
Marshall	≤ 3	≤ 3	≤ 3	0	0	0	0	0	≤ 3	0	≤ 3	0	0	0	6
McCook	5	≤ 3	0	≤ 3	0	0	0	≤ 3	≤ 3	0	0	0	0	0	≤ 3
McPherson	≤ 3	0	≤ 3	0	≤ 3	0	≤ 3	0	≤ 3	0	≤ 3	0	0	0	0
Meade	≤ 3	30	≤ 3	0	≤ 3	≤ 3	6	0	4	0	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
Mellette	0	4	0	0	0	≤ 3	0	0	≤ 3	0	≤ 3	6	0	≤ 3	≤ 3
Miner	≤ 3	9	0	0	0	≤ 3	≤ 3	0	6	0	0	≤ 3	0	0	0
Minnehaha	26	625	9	12	22	137	126	17	27	≤ 3	25	≤ 3	5	26	9
Moody	4	16	0	≤ 3	≤ 3	0	≤ 3	0	≤ 3	≤ 3	≤ 3	0	0	0	≤ 3
Pennington	20	401	≤ 3	≤ 3	6	33	68	0	27	6	11	29	4	54	≤ 3
Perkins	0	≤ 3	0	≤ 3	≤ 3	≤ 3	≤ 3	0	≤ 3	0	0	0	0	0	0
Potter	≤ 3	≤ 3	0	≤ 3	0	≤ 3	0	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	0	0	≤ 3
Roberts	5	71	0	0	≤ 3	12	≤ 3	0	≤ 3	0	≤ 3	≤ 3	0	≤ 3	4
Sanborn	≤ 3	0	0	≤ 3	≤ 3	0	≤ 3	0	≤ 3	0	0	0	0	0	0
Shannon	≤ 3	256	≤ 3	0	≤ 3	36	6	0	≤ 3	0	5	55	≤ 3	≤ 3	≤ 3
Spink	≤ 3	≤ 3	≤ 3	0	≤ 3	0	5	0	4	0	≤ 3	0	0	0	≤ 3
Stanley	≤ 3	0	0	0	0	0	0	0	0	0	0	≤ 3	0	0	0
Sully	≤ 3	≤ 3	0	0	0	0	≤ 3	0	≤ 3	0	0	0	0	0	≤ 3
Todd	0	209	0	0	≤ 3	11	5	≤ 3	0	0	12	147	≤ 3	0	≤ 3
Tripp	8	10	≤ 3	≤ 3	0	0	≤ 3	0	4	0	≤ 3	10	0	0	≤ 3
Turner	5	5	0	≤ 3	0	0	0	≤ 3	≤ 3	0	≤ 3	≤ 3	0	0	6
Union	4	12	≤ 3	0	≤ 3	≤ 3	5	≤ 3	0	0	7	0	0	5	≤ 3
Walworth	0	28	0	0	0	≤ 3	0	≤ 3	5	0	≤ 3	≤ 3	0	0	0
Yankton	≤ 3	23	31	≤ 3	8	≤ 3	10	0	20	0	≤ 3	0	0	0	≤ 3
Ziebach	0	8	0	0	0	0	0	0	0	0	0	≤ 3	0	0	≤ 3
<b>South Dakota</b>	<b>219</b>	<b>2,633</b>	<b>86</b>	<b>50</b>	<b>97</b>	<b>367</b>	<b>355</b>	<b>50</b>	<b>296</b>	<b>26</b>	<b>135</b>	<b>389</b>	<b>14</b>	<b>118</b>	<b>112</b>
Rate per 100,000	28.0	336.7	11.0	6.4	12.4	46.9	45.4	6.4	37.9	3.3	17.3	49.7	1.8	15.1	14.3
5-year median	198	2,534	42	35	89	289	NA	NA	0	8	151	131	13	NA	51
% change of median	11%	4%	105%	43%	9%	27%	NA	NA	NA	225%	-11%	197%	8%	NA	120%

In 2006 there were also: 16 cases of Hepatitis B, chronic; 13 cases each of Streptococcal disease, Group B invasive and Syphilis (primary & secondary); 10 cases of Streptococcal disease, Group A invasive; 9 cases of Hepatitis A; 7 cases of *E. coli* associated with HUS; 5 cases each of Legionellosis, Hepatitis B, acute and Tularemia; 4 cases each of drug resistant *Streptococcus pneumoniae* and Meningococcal disease; 2 cases each of Q fever and shiga-toxin producing *E. coli*, serotype unknown; and 1 case each of Hemolytic uremic syndrome of unknown cause and Lyme disease.

To safeguard privacy "≤ 3" designates strata with 1, 2 or 3 cases.

Source: South Dakota Department of Health, Office of Disease Prevention

**Table 77**  
**South Dakota Selected Notifiable Disease Summary by Gender, Race, and Age, 2006**

		Gender*				Race*							Age group (in years)						
Disease	Total	Male (%)		Female (%)		White (%)		American Indian (%)		Other or unknown (%)		Median age	<1	1-4	5-14	15-24	25-39	40-64	≥65
Campylobacteriosis	219	134	61%	85	39%	167	76%	17	8%	35	16%	26	6	30	28	39	47	54	15
Chlamydia	2633	709	27%	1,923	73%	1,311	50%	1,167	44%	155	6%	21	4		41	1,886	587	72	2
Cryptosporidiosis	86	44	49%	42	51%	80	93%	2	2%	4	5%	15	5	24	13	11	16	8	9
Shiga-toxin producing E. coli	50	18	36%	32	64%	44	88%	6	12%	0	0%	6.5	3	18	12	4	3	7	3
Giardiasis	97	49	51%	48	50%	80	83%	10	10%	7	7%	17	1	27	17	6	17	21	8
Gonorrhea	367	152	41%	215	59%	123	34%	197	54%	47	13%	22	0		5	234	107	17	1
Hepatitis C, Chronic	355	237	67%	116	33%	107	30%	29	8%	219	62%	45	0	0	2	20	85	237	6
HIV/AIDS	34	22	65%	12	35%	13	38%	8	24%	13	38%	43	1	0	1	3	9	20	0
Methicillin-resistant <i>Staph. aureas</i> , invasive	50	26	52%	24	48%	34	68%	7	14%	9	18%	65	0	0	1	1	3	20	23
Mumps	296	190	64%	106	36%	211	71%	29	10%	56	19%	27	2	19	32	80	87	61	14
Pertussis	26	10	39%	16	62%	21	81%	0	0%	5	19%	13	1	2	14	4	0	4	0
Salmonellosis	135	67	50%	67	50%	100	74%	21	16%	14	10%	23	7	23	15	26	26	31	7
Shigellosis	389	184	47%	202	52%	45	12%	333	86%	11	3%	5	21	156	103	36	36	21	4
Streptococcus A, invasive	10	8	80%	2	20%	5	50%	3	30%	2	20%	57	0	1	1	0	1	3	4
Streptococcus B, invasive	13	4	31%	9	69%	8	62%	1	8%	4	31%	57	0	0	0	1	2	4	6
Tuberculosis	14	8	57%	6	43%	1	7%	6	43%	7	50%	41	0	0	1	3	2	5	3
Varicella	118	58	49%	57	48%	68	58%	18	15%	32	27%	7.5	3	12	101	2	0	0	0
West Nile virus disease	112	68	61%	44	39%	97	87%	8	7%	7	6%	43.5	0	0	2	15	26	53	16

Total cases reported on this table may differ slightly from row totals due to incomplete case information.

\*South Dakota's overall population was 50% male and 50% female; 89% White, 9% American Indian and 2% other races.

Source: South Dakota Department of Health, Office of Disease Prevention

**VACCINE-PREVENTABLE DISEASES:** Diphtheria, Pertussis, Tetanus, Measles, Mumps, Rubella, Polio, *Haemophilus influenzae* type b disease, Varicella, Hepatitis A and B.

The Centers for Disease Control and Prevention (CDC) regards vaccination as one of the 10 great public health achievements of the twentieth century. Vaccination is responsible for the global eradication of smallpox, the elimination of poliomyelitis from the Western Hemisphere, and the control of measles, rubella, tetanus, diphtheria, *Haemophilus influenzae* type b (Hib), and other infectious diseases in the United States and many other countries.

Immunization is a fundamental component of comprehensive child health care. The South Dakota statewide goal is to immunize 90 percent of 2-year old children for measles, mumps, rubella, diphtheria, pertussis, polio, *Haemophilus influenzae* type b, varicella, tetanus and HAB.

In South Dakota, factors contributing to increased vaccination rates and disease reduction include enacting a statewide school immunization law in 1971; implementing child-care facility immunization standards; providing vaccines (measles vaccine distribution began in 1967, rubella in 1969, mumps in 1976, *Haemophilus influenzae* b in 1989, hepatitis B in 1993, hepatitis A in 1995, and chicken pox in 2001); and since 1978 providing free supplies of all required childhood vaccines for private and public clinic use. In 1996, the South Dakota Immunization Information System (SDIIS) was implemented, and it currently networks the immunization records of 258 health clinics across the state.

During 2006, no cases of measles, rubella, diphtheria, tetanus, or polio were reported in South Dakota.

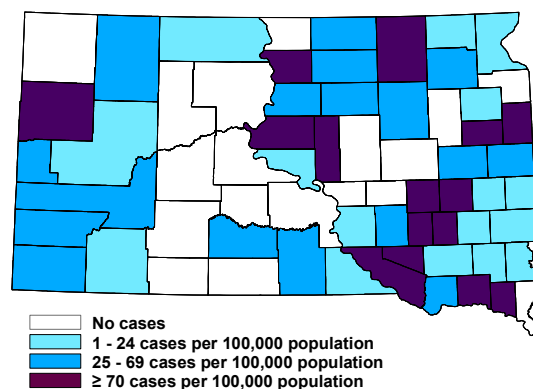
Twenty-six cases of pertussis (whooping cough) were reported in South Dakota in

2006. One of this year's cases was in a child less than one year of age.

Complications of pertussis may include severe cough, pneumonia, otitis media, seizures, encephalopathy, brain damage, and occasionally death. Pertussis is most severe in young infants, with 70 percent of all pertussis deaths occurring during the first year of life. The bacterial agent, *Bordetella pertussis*, has been isolated from 25 percent of adults with cough illness lasting more than seven days. These adults often serve as a source of infection for unimmunized children.

**Mumps** Mumps is an acute viral infection typified by inflammation and swelling of the parotid salivary glands. Complications may include deafness, meningoencephalitis, and orchitis. After nearly 20 years of decreasing cases in the United States a mumps outbreak hit several Midwestern states, including South Dakota, in 2006. Nationally, 6,617 cases of mumps were reported including 296 cases in South Dakota.

**Figure 30**  
**Mumps Incidence Rates by County,**  
**South Dakota, 2006**



Source: South Dakota Department of Health, Office of Disease Prevention

Prior to that outbreak, the last case of mumps in South Dakota was reported in 1991. The 2006 mumps cases in South Dakota were predominately female (65 percent). The median age of cases was 27 years (range 7 months to 90 years). Symptoms included parotitis 81 percent, fever 55 percent, orchitis 14 percent of post-pubertal males, oophoritis 3 percent of post-pubertal females, meningitis or encephalitis 2 percent. Six percent of cases were hospitalized and 19 percent were asymptomatic. There were no deaths. South Dakota has high rates of mumps vaccination, but despite high two-dose mumps vaccination coverage, the outbreak occurred. Forty-seven percent of our cases had two MMR vaccinations, 21 percent had one MMR, 15 percent had no MMR and 17 percent had unknown MMR vaccination status.

A decreasing trend of *Haemophilus influenzae* type b is evident from the 54 cases reported in 1990 down to zero in 2006. Invasive *H. influenzae* disease can cause meningitis, pneumonia, osteomyelitis, epiglottitis, cellulitis and pericarditis. This preventable disease has a case-fatality rate of 2 percent to 5 percent.

Immunization requirements for entrance into South Dakota schools since 2000 have included:

- a) 4 doses of diphtheria, tetanus, pertussis vaccine (DTaP or DTP), and
- b) 3 doses of poliovirus vaccine, and
- c) 2 doses of measles vaccine, and
- d) 2 doses of rubella vaccine, and
- e) 2 doses of mumps vaccine, and
- f) 1 dose of chicken pox vaccine.

The DOH strives to enroll all children in South Dakota in SDIIS.

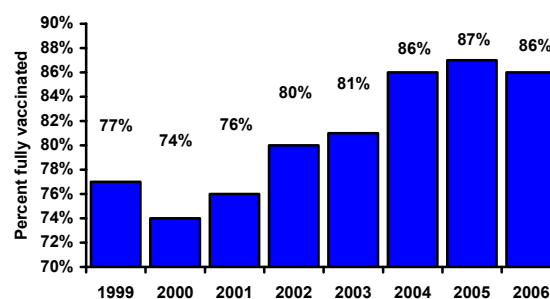
Child vaccination coverage rates are estimated by the National Immunization Survey (NIS). The NIS provides vaccination coverage estimates for children

aged 19-35 months for each of the 50 states, including South Dakota.

To collect vaccination data for age-eligible children, NIS uses a quarterly random-digit-dialing sample of telephone numbers to find households with children aged 19 to 35 months. Parents or guardians are asked to report the vaccines, with dates, that appear on the child's "shot card" kept in the home. At the end of the interview, permission is requested to contact the child's vaccination providers. The providers are then contacted by mail to verify each child's vaccinations.

In 2006, 86 percent of children 19-35 months old in South Dakota were adequately immunized (Figure 31). There has been a steadily improving trend in vaccination coverage rates since the SDIIS was launched in 1996, but we are still short of our 90 percent immunization coverage objective.

**Figure 31**  
**South Dakota Immunization Rates,**  
**Children 19-35 Months 1999 – 2006**  
(National Immunization Survey 4:3:1:3:3)



Immunization rates of children 19-35 months old immunized with 4 doses of DTaP, 3 doses polio, 1 dose of MMR, 3 doses of *Haemophilus influenzae* b, and 3 doses of hepatitis B vaccine.

Source: South Dakota Department of Health, Office of Disease Prevention

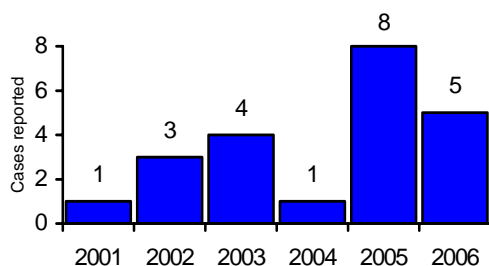
**Viral Hepatitis** There were five cases of acute hepatitis B reported in 2006 (Figure 32). The year 2004 marked the first year that chronic hepatitis B infections became reportable. There were 33 cases of chronic hepatitis B infections reported in South Dakota in 2005 and 16 cases reported in 2006. Hepatitis B is caused by a virus



transmitted by blood and other body fluids. It can cause lifelong infection, liver cirrhosis, liver cancer, liver failure, and death.

As part of a nationwide prevention program, hepatitis B vaccine has been made available for routine use in newborns and for children and adolescents who did not complete vaccination as infants. Hepatitis B vaccination is not mandatory for school entry in South Dakota. Adults at risk for hepatitis B infection who should consider vaccination include: people who have more than one sex partner in six months, men who have sex with other men, sex contacts of infected people, people who inject illegal drugs, health care and public safety workers who might be exposed to infected blood or body fluids, household contacts of persons with chronic HBV infection and hemodialysis patients.

**Figure 32**  
**Acute Hepatitis B in South Dakota,**  
**2001 – 2006**



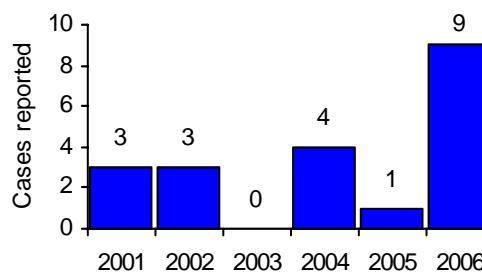
Source: South Dakota Department of Health, Office of Disease Prevention

## SEXUALLY TRANSMITTED DISEASES

Sexually transmitted diseases (STDs) include several bacterial and viral infections that can be passed person-to-person by genital, oral or anal sexual contact. STDs include gonorrhea, chlamydia, genital herpes, syphilis, genital warts, HIV infection, chancroid, trichomoniasis, lymphogranuloma venereum, and others. All STDs have the potential to cause serious illness, but most are treatable. STDs are

In 2006, there were nine cases of hepatitis A reported in South Dakota (Figure 33). Several of these cases were acquired by South Dakota residents traveling to foreign countries. The Healthy People 2010 target is 4.5 new cases of hepatitis A per 100,000 population.

**Figure 33**  
**Hepatitis A in South Dakota, 2001 – 2006**



Source: South Dakota Department of Health, Office of Disease Prevention

Hepatitis A is a virus shed in the feces and transmitted person-to-person or by contaminated food or water. The illness causes mild to serious liver disease. To prevent hepatitis A the vaccine is available for children and adults.

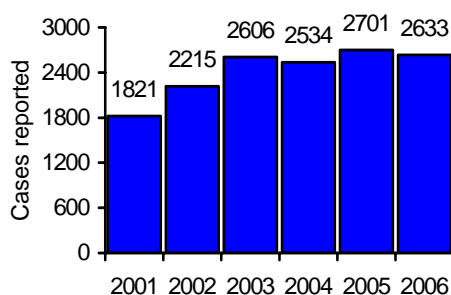
preventable by abstinence, uninfected partner monogamy, and proper use of condoms.

Over the past decade, South Dakota has generally reduced the occurrence of STDs through intensive efforts to identify and treat infected persons. Although gonorrhea and chlamydia cases have decreased, they are still common. Syphilis and

lymphogranuloma venereum have become rare, and chancroid is almost unheard of in our state. STDs in South Dakota primarily affect young people between the ages of 15 and 24 years, and minority populations.

**Chlamydia** Chlamydia is the most commonly reported STD in South Dakota. During 2006, the DOH received 2,633 case reports (Figure 34), which was an incidence rate of 336.7 cases per 100,000 population. This was an increase of 11 percent over the 5-year median.

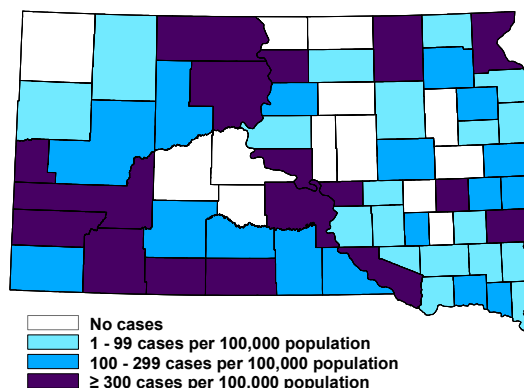
**Figure 34**  
**Chlamydia in South Dakota,**  
**2001 – 2006**



Source: South Dakota Department of Health, Office of Disease Prevention

Counties with the highest incidence (cases per 100,000 population) included Dewey (2209), Todd (2072), Shannon (1852), Corson (863), Buffalo (711), Roberts (708), Charles Mix (705), Walworth (516), Bennett (452), Pennington (425), Hughes (401), (Figure 35).

**Figure 35**  
**Chlamydia Incidence Rates by County,**  
**South Dakota, 2006**



Source: South Dakota Department of Health, Office of Disease Prevention

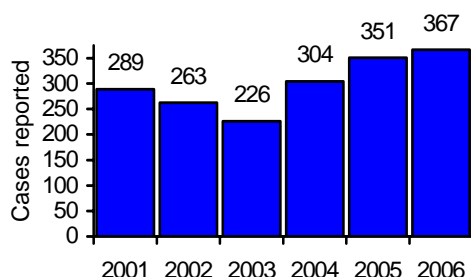
Nationally, the incidence of chlamydia in 2005 was 329.5 cases per 100,000 population. South Dakota ranked 20<sup>th</sup> that year with an incidence of 336.7.

Screening for chlamydia infection has become standard practice for many health care providers in the state. Indian Health Service, family planning clinics, and many private providers have incorporated chlamydia screening as part of the routine health examination for sexually active young women. Screening follow-up encompasses treatment and partner referral. Because screening efforts are focused on women, female infections are more likely to be identified than males. Our data show that 73 percent of chlamydia cases were female in 2006.

Young people between 15 and 24 years old accounted for 72 percent of the chlamydia cases reported in 2006. Although American Indians comprise 9 percent of the state's population, a disproportionate share, 44 percent, of chlamydia case reports were in this population group. This higher disease rate necessitates continued targeting of screening and disease intervention among American Indians.

**Gonorrhea** South Dakota has experienced a substantial increase in gonorrhea from a low of 226 cases in 2003. A notable increase was observed in 2006 with 367 cases (Figure 36), which was an incidence of 47.4 cases per 100,000 population. This is a 27 percent increase over the 5-year median.

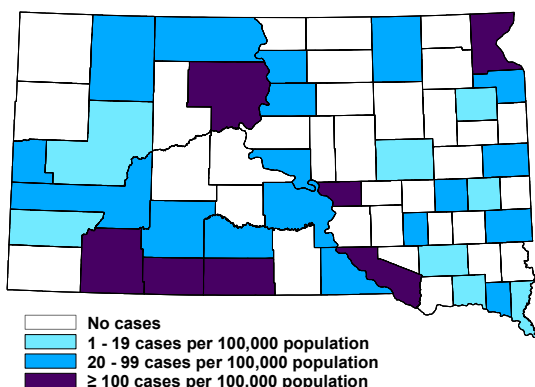
**Figure 36**  
**Gonorrhea in South Dakota,**  
**2001 – 2006**



Source: South Dakota Department of Health, Office of Disease Prevention

Thirty-four percent of the gonorrhea case reports occurred in the white population, and 59 percent were female. The Healthy People 2010 objective is 19 new cases of gonorrhea per 100,000 population. Counties with the highest incidence (cases per 100,000 population) included Dewey (655), Shannon (260), Charles Mix (195), Buffalo (142), Roberts (120), Bennett (113), and Todd (109) (Figure 37).

**Figure 37**  
**Gonorrhea Incidence Rates by County,**  
**South Dakota, 2006**



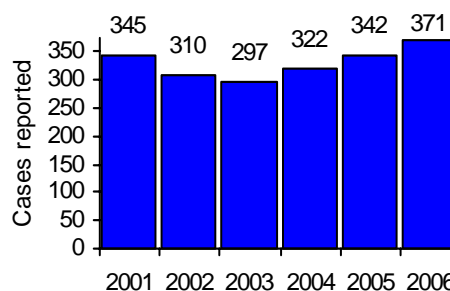
Source: South Dakota Department of Health, Office of Disease Prevention

Sexually active adolescents and young adults are the population most at risk with 64 percent of the gonorrhea cases reported being 15 to 24 years old. The American Indian population was disproportionately affected with 54 percent of the reported cases.

Nationally the incidence of gonorrhea was 115.6 cases per 100,000 population in 2005. South Dakota ranked 38<sup>th</sup> that year with an incidence of 45.2. In 2006, the incidence increased to 46.9. This represents a 15 percent increase over the 5-year median.

**Herpes** Genital herpes became reportable in 1993 in South Dakota. In 2006, 371 cases were reported (Figure 38), which was an incidence of 44.1 cases per 100,000 population.

**Figure 38**  
**Genital Herpes in South Dakota,**  
**2001 – 2006**



Source: South Dakota Department of Health, Office of Disease Prevention

Genital herpes is a recurrent, incurable viral disease caused by the herpes simplex virus 1 or 2. The infections may be asymptomatic, cause genital lesions, or rarely, severe complications such as encephalitis or disseminated infection.

Management of genital herpes depends on clinical presentation, and may include antiviral therapy and counseling for behavior adaptations and prevention.

**Syphilis** After many years of sporadic and very low syphilis rates in South Dakota, the disease made a resurgence in the state in

2006. There were 19 cases of infectious syphilis (primary and secondary, and early latent cases) reported in South Dakota in 2006 (Table 78) which was an incidence of 2.4 cases per 100,000 population. The Healthy People 2010 target for primary and secondary syphilis is 0.2 cases per 100,000 population. South Dakota participates in syphilis elimination through expedited case management, partner referral, and interstate coordination of outbreak investigations.

**Table 78**  
**Syphilis in South Dakota, 1991-2006**

Year	Secondary Primary and Secondary	Congenital	Early Latent	Late Latent
1991	1	0	5	5
1992	1	0	0	0
1993	0	0	1	0
1994	2	0	0	1
1995	0	0	1	6
1996	0	0	0	2
1997	1	0	2	5
1998	1	1	0	1
1999	0	1	1	1
2000	0	0	0	1
2001	1	0	0	0
2002	0	0	0	0
2003	2	0	3	0
2004	0	0	0	0
2005	2	0	0	0
2006	13	0	6	10
<b>Total</b>	<b>24</b>	<b>2</b>	<b>19</b>	<b>32</b>

Source: South Dakota Department of Health, Office of Disease Prevention

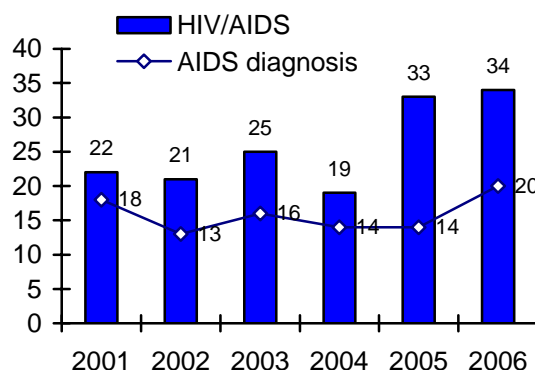
## HIV/AIDS

Acquired immunodeficiency syndrome (AIDS) is caused by an infection of human immunodeficiency virus (HIV). From 1981, when AIDS was first identified in the United States, through December 2005, 984,155 AIDS cases had been reported to the CDC. Of these cases, 550,394 (56 percent) are estimated to have died.

AIDS became a reportable disease in South Dakota in 1985 and HIV infection became reportable in 1988. Through December 2005, there were 529 cases of HIV/AIDS reported in the state (313 AIDS cases and 216 HIV cases). In 2006, there were 34 new cases of HIV reported and 20 new cases of AIDS diagnosed. Figure 39 shows the number of combined new HIV/AIDS cases reported to the DOH by year and the number of conversions to AIDS. South Dakota had one of the lowest incidence rates of AIDS in

the USA in 2005. In 2005, the AIDS incidence rate was 2.4 cases per 100,000.

**Figure 39**  
**HIV/AIDS in South Dakota, 2001 – 2006**



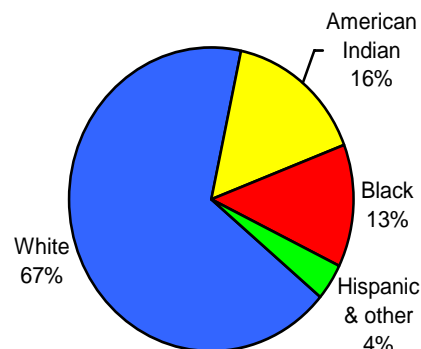
Source: South Dakota Department of Health, Office of Disease Prevention

In 2002, there were more women (62 percent) than men (38 percent) reported with HIV/AIDS, which was the first time this was

observed. In South Dakota, the number of females with HIV is still small, 22 percent cumulative as of December 2006, but the number is generally increasing yearly. Most women who become infected with HIV are in their childbearing years.

Nationally, there are a disproportionate number of AIDS cases in the Black and Hispanic communities. South Dakota's minority groups are also disproportionately affected by HIV/AIDS (Figure 40). Blacks made up 13 percent of the HIV/AIDS cases in the state, but comprise less than 1 percent of the total population. Americans Indians comprised 16 percent of the state's HIV/AIDS cases, but 9 percent of the population; and Hispanic other residents accounted for 4 percent of the HIV/AIDS cases, but only 1 percent of the population. White people make up 89 percent of the state's population, and 67 percent of the HIV/AIDS cases.

**Figure 40**  
**HIV/AIDS by Race or Ethnic Group,**  
**South Dakota, 1985-2006 (n=529)**



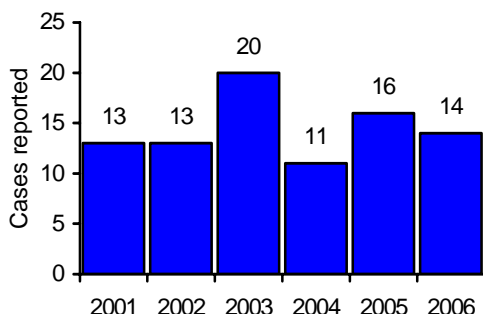
Source: South Dakota Department of Health, Office of Disease Prevention

The DOH coordinates a statewide HIV/AIDS prevention and control program. Counseling and testing sites are located in Pierre, Aberdeen, Watertown, Dupree, Rapid City, and Sioux Falls. These sites provide free, confidential counseling and testing for HIV. A toll-free statewide phone number (1-800-592-1861) is available to answer questions about AIDS and HIV during working hours. The national 24-hour AIDS number is 1-800-342-2437.

## TUBERCULOSIS

During calendar year 2006, 14 cases of active tuberculosis were reported (Figure 41) to the DOH, including one white (7%), six American Indians (43%), four black (29%) and three Asian (21%).

**Figure 41**  
**Tuberculosis in South Dakota,**  
**2001 – 2006**



Source South Dakota Department of Health, Office of Disease Prevention

The overall incidence rate was 1.9 per 100,000; with an incidence of 8.8 for American Indians, 0.1 for whites, 64.5 for blacks and 52.1 for Asians. Of the cases reported in 2006, 6 were female (43 percent) and 8 were male (57 percent).

The DOH's goal is the elimination of tuberculosis in South Dakota. The objective of the State Tuberculosis Elimination Advisory Committee was to reduce the incidence of tuberculosis in South Dakota to no more than 3.5 cases per 100,000 population by the year 2010. This overall target has been reached, including the special objective for the American Indian population which is 15 cases per 100,000.

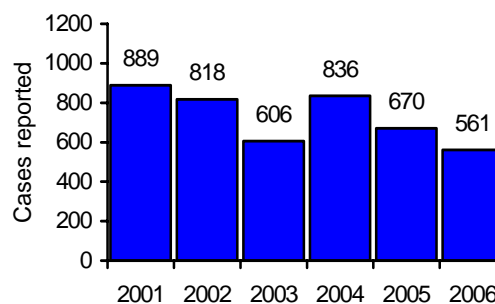
The Healthy People 2010 target is 1.0 new case of tuberculosis per 100,000 per year.

The occurrence of tuberculosis in young children is of special concern. Each child case represents a failure to stop transmission of infection and a failure to prevent the emergence of disease in an unexposed person. There was one TB case in a child aged 5-9 years of age.

There were three cases of tuberculosis reported with single drug resistance in 2006. The only case of multi-drug resistant tuberculosis was reported in 1991.

In 2006, there were 561 reports of positive skin tests for tuberculosis infection (Figure 42). Since no data is collected on negative tests, it is not known how many people were skin tested overall. Skin testing is targeted to detect persons with latent tuberculosis infection and disease who would benefit from treatment. A positive skin test indicates that the person has been exposed to active tuberculosis, and an evaluation must follow.

**Figure 42**  
**Latent Tuberculosis Infection (Positive Skin Tests) in South Dakota, 2001-2006**



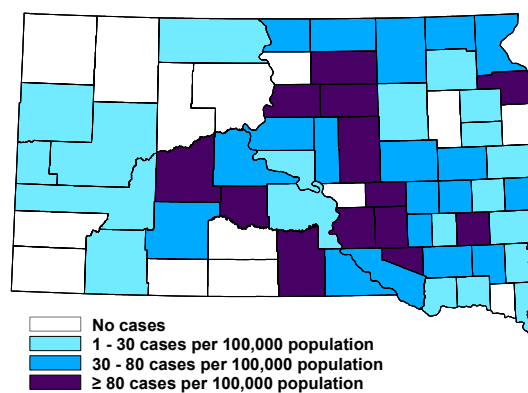
Source: South Dakota Department of Health, Office of Disease Prevention

The DOH has an aggressive tuberculosis control strategy that includes contact investigations and rigorous oversight of patient treatment adherence. The challenge to eliminate tuberculosis in South Dakota rests with preventing and monitoring disease activation among the elderly, the American Indian population, and foreign-born persons.

## FOODBORNE and DIARRHEAL DISEASES

**Campylobacteriosis** *Campylobacter* has been one of the most commonly isolated enteric bacteria in South Dakota since 1999 (Table 75). In 2006, there were 219 cases of campylobacteriosis, which is an incidence of 28.0 cases per 100,000 population. This was an 11 percent increase over the five-year median. This increase suggests a change in the transmission or the detection of campylobacteriosis in the state. Sixteen percent of the cases were in children less than five years old. Counties with the highest incidence (cases per 100,000 population) included Douglas (316), Faulk (257), Aurora (138), Tripp (132), Hand (120), Haakon (107), Edmunds (99), Brule (97), Jerauld (97), Jones (94), and Potter (86) (Figure 43).

**Figure 43**  
**Campylobacteriosis Incidence Rates by County, South Dakota, 2006**



Source: South Dakota Department of Health, Office of Disease Prevention

*Campylobacter* is a spiral-shaped Gram negative bacteria that can cause diarrhea,

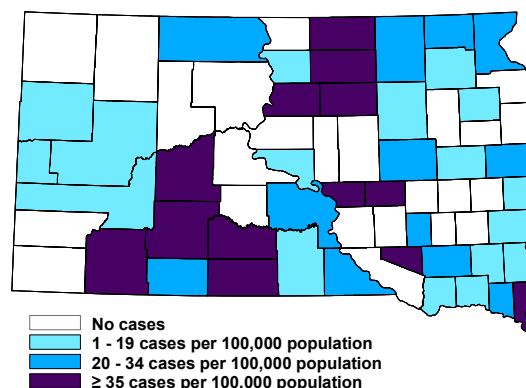


often bloody, abdominal pain, vomiting, fever, nausea, and malaise. Most cases of campylobacteriosis are relatively mild, lasting one to two days. Some cases, however, are more severe and relapses occur in about 20 percent of patients.

Complications may include convulsions, neonatal septicemia, extraintestinal infection, arthritis, Guillain-Barré syndrome, or Reiter syndrome. *Campylobacter* associated deaths are rare, occurring primarily in infants, the elderly, and immunocompromised individuals.

**Salmonellosis** There were 135 culture-confirmed cases of salmonellosis reported in South Dakota in 2006, which was an incidence of 17.3 cases per 100,000 population. This was a decrease of 11 percent from the five-year median. Twenty-two percent of the cases were reported among children less than five years old. Counties with the highest incidence (cases per 100,000 population) included Todd (119), Mellette (95), Douglas (94.7), Potter (86), Faulk (86), Edmunds (74), Jackson (69), Haakon (54), Union (51), Jerauld (48), Buffalo (47), McPherson (39), and Shannon (36) (Figure 44).

**Figure 44**  
**Salmonellosis Incidence Rates by**  
**County, South Dakota, 2006**



Source: South Dakota Department of Health, Office of Disease Prevention

Table 79 shows the most commonly isolated serotypes of *Salmonella* over the past 13 years in South Dakota. *S. typhimurium* was the most commonly isolated serotype in 2006.

South Dakota was part of a large national outbreak of *Salmonella Tennessee* stemming from peanut butter. South Dakota reported seven cases out of over 700 reported nationally.

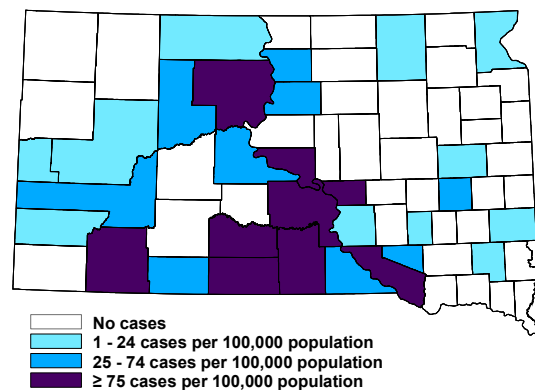
**Table 79**  
**Most Common *Salmonella* Serotypes, South Dakota, 1994-2006**

<i>Salmonella</i> serotype	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total	Percent
<i>Agona</i>	2	3	4	2	2	0	2	0	0	0	0	0	1	16	1%
<i>Bovismorbificans</i>	1	2	0	0	2	1	0	1	0	0	0	0	0	7	0%
<i>Braenderup</i>	0	0	0	1	0	3	3	2	0	3	1	6	0	19	1%
<i>Brandenburg</i>	0	1	1	0	0	0	0	0	0	0	0	1	0	3	0%
<i>Enteritidis</i>	68	23	11	8	8	8	9	12	14	15	20	24	17	237	14%
<i>Hadar</i>	2	3	1	4	4	0	7	5	0	7	1	1	2	37	2%
<i>Heidelberg</i>	1	3	6	1	6	6	11	22	10	3	6	6	5	86	5%
<i>Infantis</i>	2	1	1	1	0	0	1	2	1	1	0	9	6	25	2%
<i>Litchfield</i>	0	0	0	0	1	2	1	0	2	1	0	3	0	10	1%
<i>Montevideo</i>	2	2	1	3	2	2	1	1	4	3	6	5	5	37	2%
<i>Muenchen</i>	0	2	0	3	2	4	2	1	3	2	5	2	3	29	2%
<i>Muenster</i>	0	0	0	0	2	1	2	1	2	0	0	0	0	8	0%
<i>Newport</i>	2	2	1	9	8	8	5	6	11	9	9	10	11	91	6%
<i>Oranienburg</i>	0	0	2	1	3	2	0	1	1	2	5	5	2	24	1%
<i>Paratyphi A</i>	0	0	0	0	1	0	1	0	0	0	0	0	0	2	0%
<i>Paratyphi B</i>	0	1	1	0	4	2	1	4	0	5	3	3	3	27	2%
<i>Poona</i>	1	0	2	0	0	1	0	0	0	0	1	1	0	6	0%
<i>Reading</i>	0	4	0	0	2	0	0	0	0	0	1	0	2	9	1%
<i>Saint Paul</i>	1	1	0	0	1	3	1	1	1	5	1	0	3	18	1%
<i>Senftenberg</i>	0	0	2	0	0	0	1	1	0	0	0	0	0	4	0%
<i>Thompson</i>	2	3	39	3	3	2	1	2	2	0	1	2	2	62	4%
<i>Typhimurium</i>	36	30	24	28	61	40	28	48	36	50	60	49	45	535	34%
<i>Typhimurium-Copenhagen</i>	3	5	7	15	3	2	5	0	0	0	1	0	0	41	3%
Other serotypes	20	22	16	11	17	13	18	41	34	25	35	33	28	307	19%
<b>Total</b>	<b>143</b>	<b>108</b>	<b>119</b>	<b>90</b>	<b>132</b>	<b>100</b>	<b>100</b>	<b>151</b>	<b>121</b>	<b>131</b>	<b>156</b>	<b>160</b>	<b>135</b>	<b>1640</b>	<b>100%</b>

Source: South Dakota Department of Health, Office of Disease Prevention

**Shigellosis** In 2001, South Dakota experienced a wide-scale outbreak of shigellosis. There were 716 cases of shigellosis reported, representing a 2,210 percent increase over the five-year median. This was an incidence of 95 cases per 100,000 population, the highest in the USA. Twelve counties in the central-southwest portion of the state were most affected. In 2003 and 2004, shigellosis cases decreased back to baseline with only 17 and 13 cases respectively. In 2006, however, the number of cases increased substantially to 389 representing a 197 percent increase over the five-year median. This was an incidence rate of 49.7 cases per 100,000 population. Figure 45 shows shigellosis incidence rates (cases per 100,000 population) by county in South Dakota for 2006.

**Figure 45**  
**Shigellosis Incidence Rates by County, South Dakota, 2006**



Source: South Dakota Department of Health, Office of Disease Prevention

*Shigella sonnei* was the most common species isolated since 1993 (67 percent),



while *S. flexneri* was the second most common (Table 80).

Shigellosis is an intestinal infection causing diarrhea (may be mucoid or bloody), fever, nausea, vomiting, and abdominal cramps. Complications, such as severe dehydration or seizures, may occur, especially among infants.

**Table 80**  
**Most Common *Shigella* Serotypes,**  
**South Dakota, 1993-2006**

Year	<i>S. flexneri</i>	<i>S. sonnei</i>	<i>S. boydii</i>	Species Unk	Total
1993	31	68	1	11	111
1994	16	163	0	28	207
1995	35	128	0	37	200
1996	28	55	0	11	94
1997	16	13	0	2	31
1998	12	16	0	5	33
1999	13	4	0	1	18
2000	2	2	0	4	8
2001	6	508	1	201	716
2002	5	113	0	39	157
2003	3	9	0	5	17
2004	0	6	4	2	12
2005	1	70	5	55	131
2006	0	268	1	120	389
<b>Total</b>	<b>168</b>	<b>1423</b>	<b>12</b>	<b>521</b>	<b>2124</b>
<b>Percent</b>	<b>8%</b>	<b>67%</b>	<b>1%</b>	<b>25%</b>	<b>100%</b>

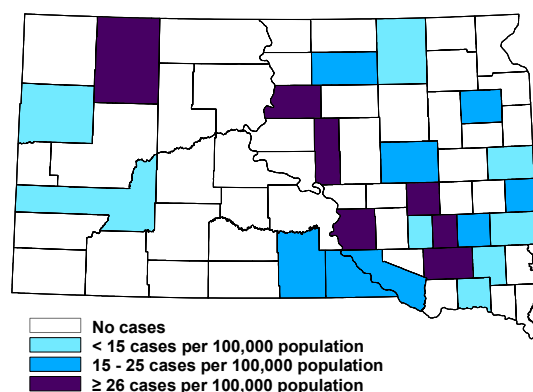
Source: South Dakota Department of Health, Office of Disease Prevention

*Shigella* is transmitted by the fecal-oral route (human feces), with a very small dose (10 organisms) sufficient to cause illness. Following exposure, illness usually follows after a one to four day incubation period. Transmission is typically person-to-person within families, child day care centers, and residential living services for the developmentally disabled. Food may also be contaminated by people not washing their hands properly. Shigellosis may also be transmitted by contaminated drinking or recreational water, anal intercourse, houseflies, or by fecally contaminated objects.

### Enterohemorrhagic *Escherichia coli*

*Escherichia coli* O157:H7 infection has been voluntarily reportable in South Dakota since 1994, and legally reportable since 1996 and all Shiga-toxin producing *E. coli* have been reportable since 2005. During 2006 there were 50 cases of Shiga-toxin producing *E. coli* reported, representing a 43 percent increase over the five-year median. This was an incidence rate of 6.4 cases per 100,000 population. Sixty-six percent of the cases were in children less than 15 years of age. There were seven cases of hemolytic uremic syndrome (HUS) associated with *E. coli* infection. Figure 46 shows *E. coli* O157:H7 incidence rates (cases per 100,000 population) by county in South Dakota for 2006.

**Figure 46**  
**Shiga-Toxin Producing *E. coli***  
**Incidence Rates by County,**  
**South Dakota, 2006**



Source: South Dakota Department of Health, Office of

*E. coli* O157:H7 is only one of several enterohemorrhagic, shiga-toxin producing serotypes of the bacteria. There were 48 cases of *E. coli* O157:H7 and also two cases of enterohemorrhagic *E. coli* (unknown serotype) reported.

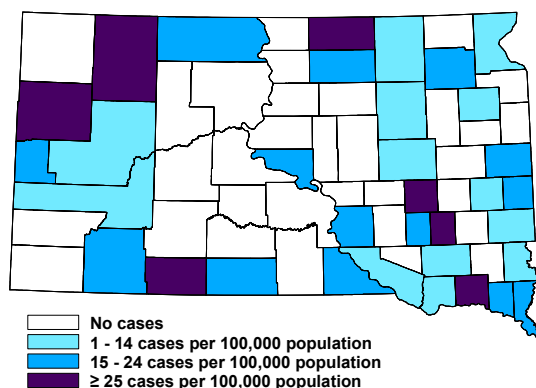
Shiga-toxin producing *E. coli* often causes severe bloody diarrhea and abdominal cramps. The illness usually resolves in five to 10 days. In some individuals, however, complications may involve severe

hemorrhagic colitis, HUS, thrombotic thrombocytopenic purpura, and even death.

Shiga-toxin producing *E. coli* is transmitted by meat, water, fresh vegetables or other foods contaminated by the intestinal contents or manure of cattle, sheep, deer, and other animals. Human infection can be prevented by proper slaughtering methods, thorough cooking of meats, proper kitchen hygiene, pasteurization of fruit juices and dairy products, and handwashing after contact with cattle or manure. Individuals with Shiga-toxin producing *E. coli* infections are restricted from commercial food handling, child day care, or patient care until two successive negative fecal samples are collected.

**Giardiasis** Giardiasis is a gastrointestinal disease caused by a protozoan parasite called *Giardia lamblia* (*G. intestinalis*) which is transmitted person-to-person or by contaminated water. During 2006, 97 cases of giardiasis were reported. This represents a nine percent increase from the five-year median. Thirty-six percent of the cases were from children less than 15 years of age. Counties with the highest incidence (cases per 100,000 population) included Hanson (81), Sanborn (80), Bennett (56), Butte (53), McPherson (39), Yankton (37), and Perkins (33) (Figure 47).

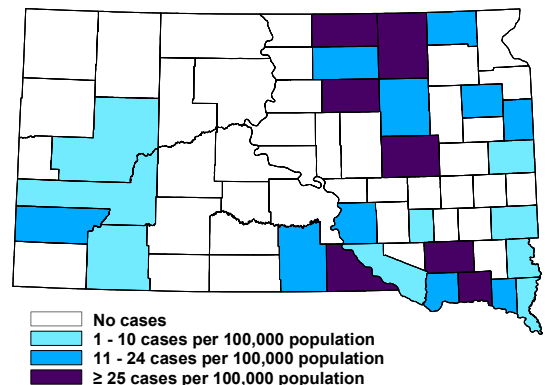
**Figure 47**  
**Giardiasis Incidence Rates by County, South Dakota, 2006**



Source: South Dakota Department of Health, Office of Disease Prevention

**Cryptosporidiosis** Cryptosporidiosis is a protozoan diarrheal disease transmitted by cattle and human feces. The disease has been reportable since 1996. Since then, 330 cases have been reported statewide. In 2006, there were 86 cases reported representing a 108 percent increase over the five-year median. Forty-nine percent of the cases were from children less than 15 years of age. Generally, an increase in reported cases is occurring nationally with outbreaks often being traced to outdoor recreational water sources and contaminated swimming pools. Figure 48 shows cryptosporidiosis incidence rates (cases per 100,000 population) by county in South Dakota for 2006.

**Figure 48**  
**Cryptosporidiosis Incidence Rates by County, South Dakota, 2006**

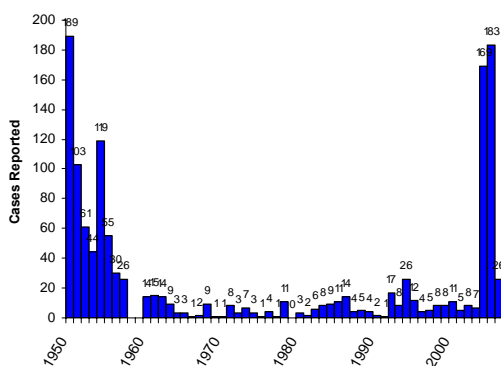


Source: South Dakota Department of Health, Office of Disease Prevention

## PERTUSSIS

During 2005, a total of 183 cases of pertussis were reported, the highest number since 1950. Pertussis, commonly called whooping cough, is an acute infectious bacterial disease caused by *Bordetella pertussis*. The bacteria produce toxins that inflame and paralyze respiratory cilia causing severe coughing. Pertussis is transmitted by aerosolized droplets of respiratory secretions from infected individuals. In the first half of the twentieth century, pertussis was a common childhood disease and major cause of death. In the 1930s South Dakota averaged 480 pertussis cases reported annually. The pertussis vaccine became available in the 1940s reducing the incidence of the disease. Since 1950 South Dakota has a median of eight cases per year. During 2006, 26 (3.3 cases per 100,000 population) cases of pertussis were reported in South Dakota (21 confirmed cases and 5 probable cases). This compares to 183 cases reported in 2005. No deaths were reported due to pertussis complications.

**Figure 49**  
**Pertussis Cases Reported in South Dakota, 1950 – 2006**



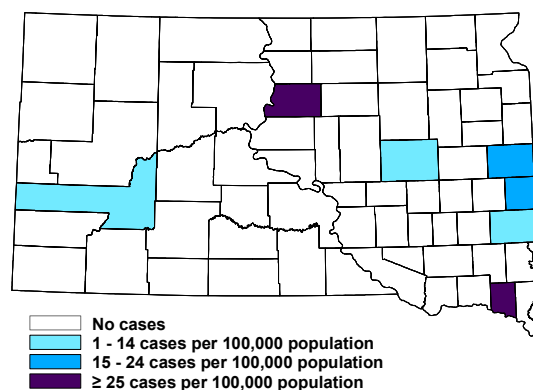
No data available for 1958 and 1959.

Source: South Dakota Department of Health, Office of Disease Prevention

In addition to the 26 cases, 334 individuals were identified as direct contacts to cases or suspects. Individuals who are direct,

exposed contacts should receive antibiotic prophylaxis, and if they are symptomatic or suspected of having pertussis, they are recommended for diagnostic testing, isolated and not allowed to attend day care, school or work. Pertussis cases were reported from 7 of 66 South Dakota counties during 2006. The counties with the most cases include Potter (129) and Clay (39).

**Figure 50**  
**Pertussis Incidence Rates by County, South Dakota, 2006**



Source: South Dakota Department of Health, Office of Disease Prevention

Infants and young children are at higher risk of pertussis-associated complications, hospitalization and death. The most common complication is secondary bacterial pneumonia. Twelve percent of cases were five years old or younger, and 65 percent were 14 years old and younger. Pertussis infected youth and adults may expose unprotected infants who are at risk of severe disease and complications.

Immunization is the best protection for infants and young children. The current pertussis vaccine is an acellular purified, inactivated vaccine (DTaP) licensed only for children six years and younger. The primary series of DTaP consists of four doses. The first three doses are given when the child is two, four, and six months old, and the fourth dose given when the child is 15-18 months

old. A fifth booster dose should be given when the child is four to six years old, before entering school. In 2004 no pertussis vaccines were licensed for persons seven years and older in the United States. This changed in 2005 with the licensing of adult and adolescent pertussis vaccines.

The current pertussis vaccine has a reported efficacy of 80 percent – 85 percent. Immunity conferred by either vaccination or natural infection wanes over time. Although unvaccinated children are at highest risk for pertussis, children who are fully vaccinated may also develop disease. Pertussis in previously immunized children is usually milder than in unvaccinated children.

The diagnostic gold standard for pertussis is a positive culture result for *Bordetella pertussis*. The preferred specimen is a nasopharyngeal aspirate or a nasopharyngeal swab. Throat or anterior nasal specimens are unacceptable. Molecular polymerase chain reaction (PCR) testing of nasopharyngeal specimens became available at the SD Public Health Laboratory in 2004. The PCR method is more sensitive than the traditional culture method and is likely responsible in part for more cases reported. The direct fluorescent antibody (DFA) stain of a nasopharyngeal swab is unreliable, so this test cannot be used to confirm pertussis. Serologic testing is not acceptable for clinical diagnosis.

## INFLUENZA

### Summary

The 2006-07 influenza season was of mild severity, typical duration, and peaked mid season. A total of 400 laboratory confirmed influenza cases, 370 influenza A and 30 influenza B, were reported to the South Dakota Department of Health (SD DOH) from the beginning of the influenza season starting October 1<sup>st</sup> through season's end on May 26<sup>th</sup>. The peak of the influenza season occurred during the second full week of February, MMWR Week 7 ending February 17<sup>th</sup>. One hundred thirty-two influenza hospitalizations and six influenza deaths were reported for the season. This was the first year influenza hospitalizations and all influenza deaths were mandatory reportable.

### Background

The Centers for Disease Control and Prevention (CDC) guidelines for the 2006-07 season were published in the *Prevention and Control of Influenza* MMWR on July 28<sup>th</sup>, 2006, Vol. 55, No. RR-10, <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5510a1.htm>

Approximately 110 to 115 million doses of influenza vaccine were produced for the

2006-07 influenza season. The doses were produced by four companies: Sanofi Pasteur, MedImmune Vaccines, Novartis (formerly Chiron Corporation), and GlaxoSmithKline. The trivalent vaccine included A/New Caledonia/20/1999 (H1N1)-like, A/Wisconsin/67/2005 (H3N2)-like, and B/Malaysia/2506/2004-like antigens.

The South Dakota Department of Health (SD DOH) ordered a total of 44,300 doses of influenza vaccine, 23,900 doses for Community Health Services field offices and 20,400 doses for clinics participating in the Vaccines For Children program. In addition, SD DOH promoted the influenza prevention campaign *Stop it . . . Don't spread it* by distributing posters in newspapers and to healthcare and childcare facilities. New for the season were the *Be A Germ Stopper!* clings which were distributed to schools and healthcare facilities.

Results from the 2005 Behavioral Risk Factor Surveillance System (BRFSS) showed South Dakota ranking 2<sup>nd</sup> in the nation with 76.3 percent of individuals aged

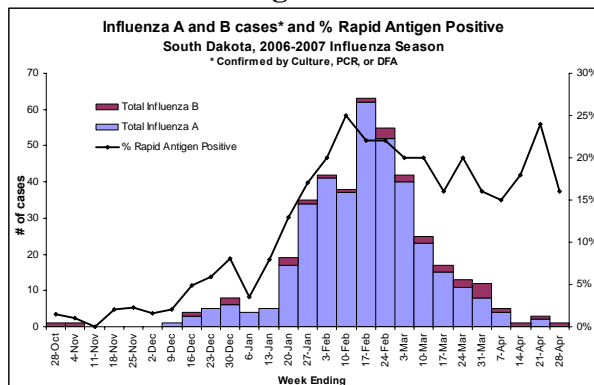
≥ 65 years receiving influenza vaccination. The survey also showed the state ranking 22<sup>nd</sup> in pneumococcal vaccination coverage with 66.3 percent of individuals in that age group receiving vaccine.

### Epidemiology and Laboratory Surveillance

The SD DOH and SD Public Health Laboratory (SDPHL) conduct surveillance for influenza year-round, and intensifies activities October through May. The components of South Dakota's influenza surveillance program for the 2006-07 season included 30 sentinel sites, five Sentinel Provider Network physicians, SDPHL culture and PCR testing, reporting of aggregate rapid antigen results, confirmed influenza, influenza hospitalizations and deaths, and institutional outbreaks.

South Dakota's first case of influenza was identified during MMWR Week 43, ending October 28<sup>th</sup>, 2006 (Figure 51). The case, a 7 month-old male from Lyman County, was positive for influenza B by PCR and culture at the SD Public Health Laboratory.

**Figure 51**



Source: South Dakota Department of Health, Office of Disease Prevention

Following the first positive detection, influenza activity remained low until the end of January. Activity then steadily increased in both percentage of positive rapid antigen tests and laboratory confirmed cases until the peak was reached during the second full week of February, MMWR Week 7, ending February 17<sup>th</sup>. This coincided well with both the peaks in influenza-associated

hospitalizations occurring week ending February 24<sup>th</sup> and national influenza test data occurring during weeks ending February 10<sup>th</sup> and 17<sup>th</sup>.

**Table 81**  
**Viral Respiratory Reports**  
**SDPHL and USD-CVL**  
**Oct 1, 2006 – May 26, 2007**

	SDPHL	USD-CVL	TOTAL
Influenza A	183*	192	386
Influenza B	16†	21	37
Adenovirus	3	127	130
RSV	4	433	437
Parainfluenza-1	3	11	14
Parainfluenza-2	2	19	21
Parainfluenza-3	6	200	206
Parainfluenza-4	0	29	29

\*140 influenza A/H1; 37 influenza A/H3

† 2 influenza B/Malaysia

□ In cooperation with Influenza Sentinel Sites (including Pine Ridge Indian Health)

Source: South Dakota Department of Health, Office of Disease Prevention

A total of 400 influenza isolates, 370 (93 percent) influenza A and 30 (7 percent) influenza B, were reported to SD DOH from SDPHL, Pine Ridge Indian Health, and the University of South Dakota Clinical Virology Laboratories (USD-CVL) in Sioux Falls and Rapid City. Of 370 influenza A isolates, 140 (38 percent) subtyped as A/H1, 37 (10 percent) subtyped as A/H3, and 193 (52 percent) were not subtyped (Table 81). Of the 30 influenza B isolates identified, 2 (7 percent) were subtyped as B/Malaysia, and 28 (93 percent) were untyped.

Other viral respiratory pathogen reports included 130 adenovirus, 14 parainfluenza type 1, 21 parainfluenza type 2, 206 parainfluenza type 3, 29 parainfluenza type 4, and 437 respiratory syncytial virus (RSV).

The median age of confirmed influenza cases was 8 years of age with an age range of 26 days to 99 years (Table 82). There were 226 (57 percent) cases < 10 years old and 281 (70 percent) were <20 years old. Individuals >65 years of age accounted for only 32 (8 percent) cases. Gender data were available for 389 (97 percent) influenza



cases. 183 (47 percent) were female, 206 (53 percent) were male.

<b>Table 82</b> <b>Age Distribution of Reported</b> <b>Influenza Cases, South</b> <b>Dakota, 2006-2007 Season.</b>		
Age group	#	Percent
0 - 9 yr	226	57%
10 - 19 yr	55	14%
20 - 29 yr	28	7%
30 - 39 yr	23	6%
40 - 49 yr	22	6%
50 - 59 yr	12	3%
60 - 69 yr	7	2%
70 - 79 yr	10	3%
80 - 89 yr	13	3%
90+ yr	4	1%
TOTAL	400	

Source: South Dakota Department of Health, Office of Disease Prevention

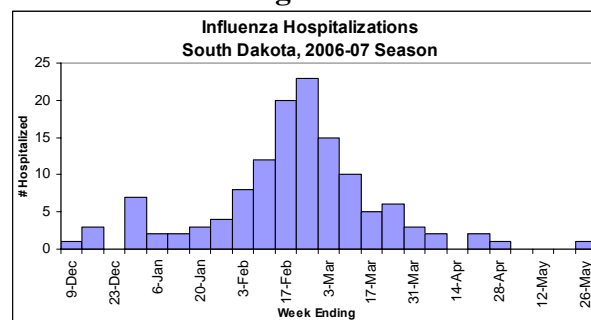
Influenza-associated hospitalizations became officially reportable on December 25<sup>th</sup>, 2006. Prior to that, SD DOH requested hospitals, clinics, physicians, and nurses report those events voluntarily. The first hospitalization was identified during MMWR Week 49, ending December 9<sup>th</sup>. Cases peaked during week ending February 24<sup>th</sup> when 23 patients were hospitalized for influenza.

For patients who were hospitalized with influenza, the age range was 25 days to 97 years with a median age of 25.5 years. Further age stratification revealed 43 percent of hospitalized cases were <10 years of age and 33 percent were >65 years of age. Seventy-two (55 percent) cases were female and 60 (45 percent) were male.

Six individuals died due to influenza and its complications during the 2006-07 influenza season. Gender breakdown was 17 percent male and 83 percent female. The median age was 86.5, with an age range of 8 - 97 years.

During the season, 152 South Dakotans died from pneumonia or influenza (provisional data).

**Figure 52**



Source: South Dakota Department of Health, Office of Disease Prevention

### National Influenza Surveillance Data (Provisional data)

The percentage of positive influenza tests and total number of isolates testing positive increased steadily starting in December and peaked in mid-February during Weeks 6 and 7, ending February 10<sup>th</sup> and February 17<sup>th</sup>.

172,735 respiratory specimens were tested for influenza with 23,181 (13 percent) positive: 18,392 (79 percent) were influenza A and 4,789 (21 percent) were influenza B. Among the influenza A isolates subtyped, 21 percent were influenza A/H1, 12 percent were influenza A/H3, and 67 percent were untyped. The full report is available at [www.cdc.gov/flu/weekly/fluactivity.htm](http://www.cdc.gov/flu/weekly/fluactivity.htm)

The ACIP *Recommendations on Prevention and Control of Influenza* and 2007-2008 vaccine composition can be found in the July 13<sup>th</sup>, 2007 MMWR Vol. 56, No. RR-06 at

<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5606a1.htm> During the influenza season, weekly summary reports are posted on the SD Department of Health Web site at: [www.flu.sd.gov](http://www.flu.sd.gov)

## RABIES

Rabies is enzootic in South Dakota. In 2006, 645 animals were submitted for rabies testing with 37 animals testing positive. This was the lowest number of rabid animals reported in South Dakota since at least 1960. The 37 rabies positive animals included 26 wild animals (24 skunks and 2 bats) and 11 domestic animals (5 cats, 4 cattle, 1 dog and 1 horse) (Table 83). There were no human rabies cases in South Dakota in 2006. Our last human case was in 1970. The animals testing negative in 2006 include 72 cattle, 64 bats, 52 raccoons, 23 skunks, 10 deer, 10 horses, 10 opossums, 8 sheep, 6 squirrels, 4 muskrats, 3 coyotes, 2 each fox, gopher, mink, rat, woodchuck, and 1 each beaver, kangaroo, prairie dog, and rabbit.

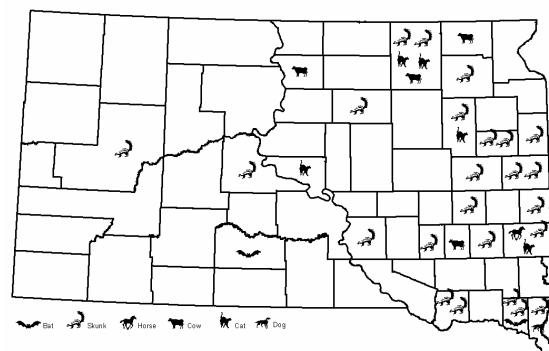
**Table 83**  
**Animals Tested and Confirmed Rabies Cases,**  
**SD, 1990-2006**

Animal	2006		1990 - 2006		
	Pos	Total tested	Pos	Total tested	% Pos
Skunk	24	47	1275	1877	68%
Cat	5	208	94	4516	2%
Cattle	4	76	232	2246	10%
Bat	2	66	75	2223	3%
Dog	1	130	104	3109	3%
Horse	1	11	57	375	15%
Raccoon	0	52	3	890	0%
Opossum	0	10	1	76	1%
Deer, elk, donkey	0	10	0	98	0%
Sheep	0	8	6	175	3%
Squirrel/chipmunk	0	6	0	65	0%
Rodents*	0	6	0	454	0%
Muskrat	0	4	0	42	0%
Coyote or wolf	0	3	0	60	0%
Woodchuck	0	2	1	19	5%
Weasel/ferret/mink	0	2	0	73	0%
Fox	0	2	8	91	9%
Rabbits and hares	0	1	0	17	0%
Bison	0	0	2	11	18%
Badger	0	0	3	22	14%
Shrew or mole	0	0	1	7	14%
Pig	0	0	3	29	10%
Mountain lion	0	0	0	2	0%
Goat	0	0	2	39	5%
Bobcat or bear	0	0	0	5	0%
Other animals	0	1	2	17	0%
<b>TOTAL</b>	<b>37</b>	<b>645</b>	<b>1967</b>	<b>16538</b>	<b>11%</b>

\*Rodents: rat, mouse, prairie dog, gopher, beaver, porcupine, vole

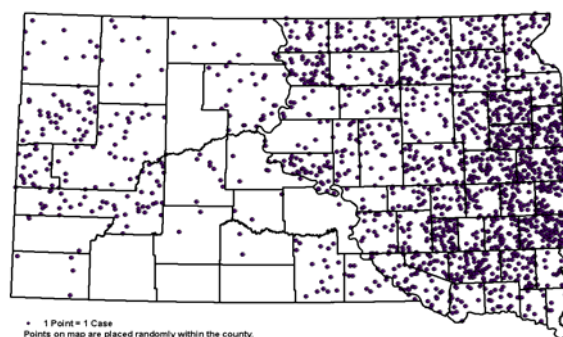
Source: South Dakota Department of Health, Office of Disease Prevention

**Figure 53**  
**Animal Rabies in South Dakota, 2006**



In 2006 rabid animals were detected in 24 South Dakota counties (Figure 53). Animals were submitted for testing from all counties except Bennett, Buffalo, Corson, Jackson, Jones, Sully, Todd and Ziebach. From 1990 through 2006, 1,967 of 16,538 animals tested positive for rabies (11 percent) (Table 84). During these 17 years animals were submitted for testing from all counties, and rabid animals were detected in all counties except Bennett, Shannon, Todd, and Ziebach. Minnehaha County submitted the most animals for testing (2,711) and Ziebach County submitted the fewest (4).

**Figure 54**  
**1990-2006 South Dakota Animal Rabies Detections**



Source: South Dakota Department of Health, Office of Disease Prevention

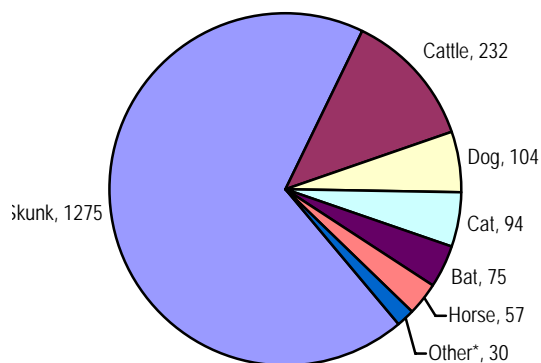
Since 1990, 27 percent of rabid animal cases in South Dakota have been domestic animals. Rabid livestock included 232 cattle, 57 horses, 6 sheep, 3 pigs, and 2

goats. There have also been 104 rabid dogs and 94 rabid cats, many of which were unvaccinated strays.

The common skunk (*Mephitis mephitis*) is the enzootic rabies reservoir in South Dakota. Since 1990, 68 percent of skunks tested have been rabid. Bat rabies is also enzootic in South Dakota with 75 of 2,223 (3 percent) bats testing positive since 1990.

Rabies is not considered enzootic in other wild animals in South Dakota. Since 1990, however, rabies has been detected in 8 foxes, 3 badgers, 3 raccoons, 2 bison, 1 opossum, 1 shrew, and 1 woodchuck (Figure 55). These other animals are likely spillover rabies following exposure to rabid skunks.

**Figure 55**  
**Rabid Animals, South Dakota**  
**1990-2006**



\*Others include fox 8, sheep 6, raccoon 3, pig 3, badger 3, goat 2, bison 2, opossum 1, woodchuck 1, shrew 1.

Source: South Dakota Department of Health, Office of Disease Prevention

Although rabid animal events occur throughout the year in South Dakota, most rabies events occur during the spring and summer months.

Nationally there have been 23 human rabies cases in the United States since 2000. Seventeen of the human cases (74 percent) have been associated with a bat-rabies virus, 5 (22 percent) were dog virus (all foreign

County	2006		1990 – 2006		
	Pos	Neg	Pos	Neg	% Pos
Aurora	0	5	27	100	21%
Beadle	0	10	58	260	18%
Bennett	0	0	0	25	0%
Bon Homme	2	5	16	102	14%
Brookings	2	34	80	750	10%
Brown	5	28	82	500	14%
Brule	1	13	23	151	13%
Buffalo	0	0	6	25	19%
Butte	0	13	38	291	12%
Campbell	0	1	22	65	25%
Charles Mix	0	15	38	211	15%
Clark	2	7	41	119	26%
Clay	3	8	10	146	6%
Codington	0	19	59	363	14%
Corson	0	0	7	24	23%
Custer	0	1	4	50	7%
Davison	1	15	48	481	9%
Day	1	8	54	164	25%
Deuel	1	11	59	278	18%
Dewey	0	1	25	79	24%
Douglas	0	4	25	111	18%
Edmunds	0	7	19	108	15%
Fall River	0	4	4	204	2%
Faulk	1	3	26	66	28%
Grant	0	3	34	233	13%
Gregory	0	5	15	128	10%
Haakon	0	1	9	85	10%
Hamlin	2	14	61	188	24%
Hand	0	3	31	109	22%
Hanson	1	1	15	69	18%
Harding	0	1	11	38	22%
Hughes	1	25	39	359	10%
Hutchinson	0	17	68	323	17%
Hyde	0	3	20	112	15%
Jackson	0	0	2	90	2%
Jerauld	0	3	18	77	19%
Jones	0	0	3	26	10%
Kingsbury	1	11	67	268	20%
Lake	0	22	42	282	13%
Lawrence	0	12	20	202	9%
Lincoln	0	12	14	277	5%
Lyman	0	2	2	65	3%
Marshall	1	5	34	150	18%
McCook	1	12	42	209	17%
McPherson	0	5	35	149	19%
Meade	1	2	30	279	10%
Mellette	1	2	2	20	9%
Miner	1	7	29	113	20%
Minnehaha	3	72	98	2613	4%
Moody	1	13	43	185	19%
Pennington	0	56	46	1237	4%
Perkins	0	1	11	48	19%
Potter	0	1	11	42	21%
Roberts	0	12	47	299	14%
Sanborn	0	1	26	88	23%
Shannon	0	1	0	60	0%
Spink	0	2	28	162	15%
Stanley	1	2	5	28	15%
Sully	0	0	7	19	27%
Todd	0	0	0	91	0%
Tripp	0	10	17	181	9%
Turner	0	19	45	350	11%
Union	2	8	9	153	6%
Walworth	1	22	43	371	10%
Yankton	0	8	17	216	7%
Ziebach	0	0	0	4	0%
<b>South Dakota</b>	<b>37</b>	<b>608</b>	<b>1867</b>	<b>14671</b>	<b>11%</b>

Source: South Dakota Department of Health, Office of Disease Prevention



imports), and 1 (4 percent) was a raccoon virus variant. These human rabies cases were from Arkansas, California (5), Florida, Georgia, Indiana, Iowa, Minnesota, Mississippi, New York, Oklahoma, Puerto Rico, Tennessee, Texas (4), Virginia and Wisconsin (2).

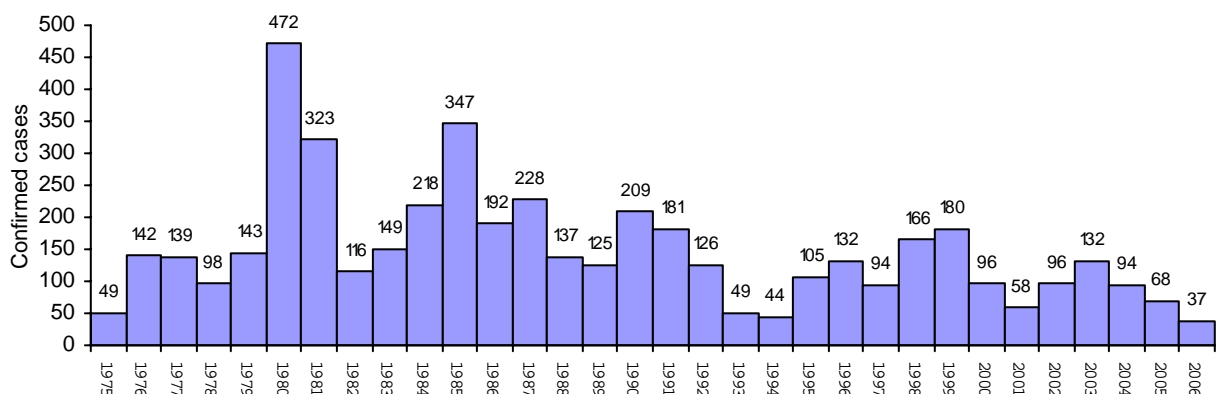
The latest national animal rabies surveillance information reported is for year 2005 (Blanton, et. al., 2006). Nationally, there were 6,417 cases of animal rabies reported in 2005. According to Blanton 92 percent of the rabies cases were wild animals and 8 percent were domestic animals. Nationally domestic animals included 269 cats, 93 cattle, 76 dogs, 47 horses/mules, 6 goats, and 3 sheep.

In 2005 South Dakota had 14 rabid cattle, the most of any state in the country, and 6 rabid horses, second most in the country. Nationally, wild animals testing positive for rabies included 2,534 raccoons, 1,478 skunks, 1,408 bats, 376 foxes, 61 mongooses, 25 groundhogs, 18 bobcats, 8

coyotes, 7 deer, 3 beavers and 1 opossum. Two laboratories test for rabies in South Dakota: (1) the Animal Disease Research Diagnostic Laboratory (ADRDL) in Brookings, and (2) the State Public Health Laboratory (SDPHL) in Pierre. Both laboratories use the direct fluorescent antibody (DFA) technique. The case definition of a confirmed animal rabies case is a positive DFA test, performed preferably on central nervous system tissue, or isolation of the rabies virus in cell culture or in a laboratory animal. Human serum rabies antibody titers on previously vaccinated people may be ordered through the Public Health Laboratory.

Rabies consultations are available from the Office of Disease Prevention, South Dakota Department of Health, 7 days a week. Consultations are based on current Centers for Disease Control and Prevention (CDC) recommendations. We strive to recommend appropriate rabies prevention measures and to minimize unnecessary and inappropriate post-exposure testing and prophylactic treatment.

**Figure 56**  
**Animal Rabies in South Dakota, 1975-2006**



Source: South Dakota Department of Health, Office of Disease Prevention

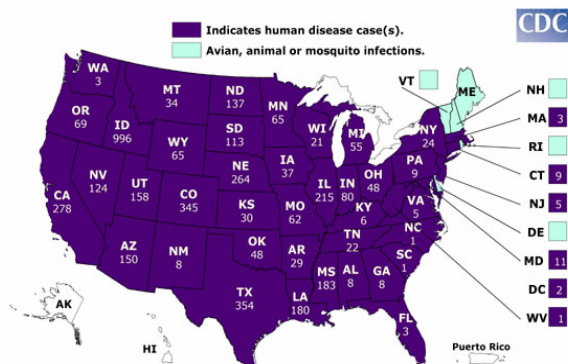
## West Nile Virus

West Nile virus (WNV) was first detected in the Western Hemisphere in 1999 in New York City. The virus spread west across the continent, reaching South Dakota in 2002. West Nile virus is now endemic in much of North America, including South Dakota.

2006 was the eighth year of WNV transmission in North America and the fifth transmission season in South Dakota. In 2003, North America experienced the largest ever recorded arboviral epidemic. The 2003 epidemic was centered in the Great Plains region with South Dakota having the third most WNV cases and the highest incidence of neuroinvasive disease (NID) in the country. The 2004 epidemic was centered in the Southwestern United States.

Nationally in 2006 there were 4,269 human WNV cases reported, with 177 deaths (Figure 57). The WNV cases included 1,459 NID cases (encephalitis or meningitis), 2,616 with WNV fever, and 194 other diagnostic status.

**Figure 57**  
**West Nile Human Deaths/Cases, United States, 2006**



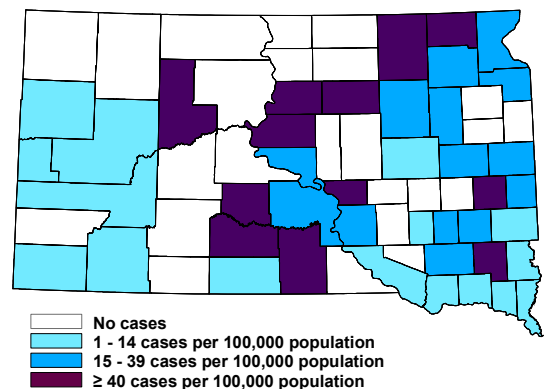
Source: South Dakota Department of Health, Office of Disease Prevention

In South Dakota, there were 112 human cases of WNV disease and three deaths reported in 2006. Of these cases 38 were diagnosed with neuro-invasive disease (NID 34 percent) and 74 had West Nile fever (66

percent), a milder form of the disease. No cases were reported to have had Acute Flaccid Paralysis. By contrast, in 2003 there were 1039 human WNV cases, including 170 cases of NID and 869 cases of WN fever in South Dakota. Of these cases, 19 were reported with Acute Flaccid Paralysis and 14 died of WNV-associated illness.

The overall incidence of West Nile disease in 2006 was 14.3 cases per 100,000 population. Figure 58 shows the incidence by county. The overall statewide incidence of WNV NID was 4.9 case per 100,000.

**Figure 58**  
**Human West Nile Disease Incidence Rates by County, South Dakota, 2006**



Source: South Dakota Department of Health, Office of Disease Prevention

The screening of donated blood has enhanced the safety of the blood supply and prevented many cases of WNV disease. In South Dakota 12 viremic blood donations were detected and removed from the blood supply in 2006.

During WNV season individuals with severe or unusual headaches should seek medical care as soon as possible. Physicians are encouraged to have a high index of suspicion for WNV disease. Free WNV testing is available at the South Dakota Public Health Laboratory for ill suspects. We do not encourage testing mildly ill

patients or individuals who wish to know if they have an antibody titer. Serum or CSF

should be submitted to the Public Health Laboratory.

## OTHER INFECTIOUS DISEASES

### ***Neisseria meningitidis* invasive disease**

There were four cases of invasive *Neisseria meningitidis* disease reported in 2006. This is an incidence of 0.5 cases per 100,000 population. The Healthy People 2010 target was 1.0 new cases of meningococcal disease per 100,000 population.

**Vector borne diseases** in South Dakota in 2006 included five cases of tularemia, one case each of Lyme disease and malaria. Although detections of plague in prairie dogs were reported in southwest South Dakota, there were no human cases detected in 2006.

**Other Infectious Diseases** There were 10 cases of invasive Group A *Streptococcus*, 13 cases of invasive Group B *Streptococcus*, and four cases of invasive drug resistant *Streptococcus pneumoniae* reported in 2006. There were also 118 cases of chickenpox and 50 cases of invasive Methicillin-Resistant *Staphylococcus aureus* (MRSA) in 2006. Additionally, 14 cases of non-meningococcal bacterial meningitis, five cases of legionellosis and two cases of listeriosis were reported. There were no reported cases of Streptococcal Toxic Shock Syndrome in 2006.

